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(54) Title: CREATING AND EDITING DIGITAL VIDEO MOVIES

(57) Abstract

A software-based method that enables the automated creation, modification and editing of digital video movies from digital data items searched in, and retrieved from, digital media databases. This is done through the use of software tools, specific to each video movie, which are called templates. A template includes user-selected parameters which are part of the digital video items that are to form the movie, or that affect these items. Some of these parameters are used by a software program for the search and the retrieval of those digital video items, while other parameters are used by that software program for the adaptation of the selected items during editing, leading to flexibility and adaptability in the creation of the video movies.

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## CREATING AND EDITING DIGITAL VIDEO MOVIES

Field and Background of the Invention

The present invention relates to a method for the automated and semi-automated creation  
5 and editing of digital video movies from digital items found in digital media databases, through the  
creation of templates which determine the content and the style of the movies.

As will be appreciated by those skilled in the art, digital video movies have numerous  
applications. For example, many of these video movies are used as sales presentations by sales  
personnel to customers from different countries or cultures, or with different backgrounds. Other  
10 video movies are used for training different employee groups and the like. In these cases, it is  
desirable to edit and modify the video movie so that each created version is best suited for the  
background of each viewer, or for each group of viewers. Another common use of video editing is  
for the preparation of documentary movies. Some of the same source material may be used in many  
different documentary movies, and convenient access to the video material is advantageous.

15 The preparation of digital video movies is currently done by the use of programs or  
software. These programs could be divided into several groups, including software which is used  
to edit movies, software which manages the information related to the movies and software video  
technology programs. Editing software programs select clips, sequence them, add to them, or  
insert text and graphical effects and the like to the clips. Software which handles information  
20 describing the media items in the database, such as their lengths, topics, dates and any other useful  
and pertinent information also provides a link to the media items on their storage media. Software  
video technology programs capture and play back digital video, thereby providing the ability to add  
and remove video, sound, text, image and 3D object tracks to the video stream. Examples of such  
programs include Microsoft™ DirectX™ and Apple™ QuickTime™.

25 The product of this movie creation process is a digital file that includes and merges all of  
the elements used for its creation. The finished movie is essentially impossible to disassemble into  
the original source components, as they merge together in a way that makes this disassembly either  
impractical or impossible. Therefore both the video source and the edited movie must be kept and  
stored, thus increasing the required storage space. This imposes a major burden on the storage  
30 devices, as the same source material could be used in many video movies.

There is therefore a need for, and it would be useful to have, a method for creating video  
movies from a plurality of elements of the video movie according to a template, such that these  
elements could potentially be reused for more than one movie and such that the automated creation

of multiple movies, each movie created according to the needs of the software user, is easy and practical.

### SUMMARY OF THE INVENTION

5 An object of the present invention is the provision of a software-based method that enables the automated or semi-automated creation, modification and editing of digital video movies from digital data items searched in, and retrieved from, digital media databases. This is done through the use of mathematical structures, specific to each type of video movie, which are called templates. A template includes predefined parameters which are part of the digital video items that are to form 10 the movie, or that affect these items. Some of these parameters are used by a software program for the search and the retrieval of those digital video items, while other parameters are used by that software program for the adaptation of the selected items during editing, leading to flexibility and adaptability in the creation of the video movies.

According to the present invention, there is provided a method for the automatic or semi-automatic creation of a video movie from a plurality of video items, each of the plurality of video items having at least one video parameter, the steps of the method being performed by a data processor, the method comprising the steps of: (a) choosing a template, the template including an identifier for retrieving at least one video item, the at least one video item forming a basis for at least a part of the video movie and the template including a style parameter for determining a style 15 of the at least a part of the video movie; (b) choosing at least one accessory item selected from the group consisting of a video style item, a text item, a sound item and a graphical item according to the style parameter; and (c) assembling the at least one video item and the at least one accessory item to produce the at least a part of the video movie according to the template.

20 Preferably, the identifier of the template identifies the at least one video item according to the parameter of the at least one video item.

Also preferably, the style parameter determines a style for the at least a part of the video movie. More preferably, the step of assembling the at least one video item and the at least one accessory item further comprises the step of: (i) editing at least one of the at least one accessory item and the at least one video item according to the style of the style parameter in the template. 25 Most preferably, the step of editing at least one of the at least one accessory item and the at least one video item further comprises the step of determining a characteristic of the at least one accessory item selected from the group consisting of a horizontal position, a vertical position, a size, a color and a layer according to the style parameter.

Preferably, the video movie is divided into a plurality of portions and the style parameter determines the style for only one of the plurality of portions according to the template. More preferably, the plurality of video items and the at least one accessory item are stored in a database, such that the plurality of video items and the at least one accessory item are retrieved from the  
5 database according to a key.

Preferably, the method further comprises the step of: (d) manually editing the template.

More preferably, the method further comprises the step of: (e) manually editing a visual layout of the at least a part of the video movie. More preferably, the step of manually editing the visual layout further comprises the steps of: (i) displaying the at least one video item and the at  
10 least one accessory item; and (ii) manually manipulating the at least one video item and the at least one accessory item.

Hereinafter, the term "computer" includes, but is not limited to, personal computers (PC) having an operating system such as DOS, Windows™, OS/2™ or Linux; Macintosh™ computers; computers having JAVA™-OS as the operating system; and graphical workstations such as the  
15 computers of Sun Microsystems™ and Silicon Graphics™, and other computers having some version of the UNIX operating system such as AIX™ or SOLARIS™ of Sun Microsystems™; or any other known and available operating system. Hereinafter, the term "Windows™" includes but is not limited to Windows95™, Windows 3.x™ in which "x" is an integer such as "1", Windows NT™, Windows98™, Windows CE™ and any upgraded versions of these operating  
20 systems by Microsoft Corp. (USA).

Hereinafter, the term "computing platform" refers to any particular operating system and/or hardware device, as previously described, according to which the present invention is operated.

Hereinafter, the term "Web browser" refers to any software program which can display text,  
25 graphics, or both, from Web pages on World Wide Web sites. Hereinafter, the term "Web page" refers to any document written in a mark-up language including, but not limited to, HTML (hypertext mark-up language) or VRML (virtual reality modeling language), dynamic HTML, XML (extended mark-up language) or related computer languages thereof, as well as to any collection of such documents reachable through one specific Internet address or at one specific  
30 World Wide Web site, or any document obtainable through a particular URL (Uniform Resource Locator). Hereinafter, the term "Web site" refers to at least one Web page, and preferably a

plurality of Web pages, virtually connected to form a coherent group. Hereinafter, the term "Web server" refers to a server for providing one or more Web pages to a Web browser upon request.

Hereinafter, the phrase "display a Web page" includes all actions necessary to render at least a portion of the information on the Web page available to the computer user. As such, the phrase includes, but is not limited to, the static visual display of static graphical information, the audible production of audio information, the animated visual display of animation and the visual display of video stream data.

The method of the present invention could be described as a series of steps performed by a data processor, and as such could optionally be implemented as software, hardware or firmware, or a combination thereof. For the present invention, a software application could be written in substantially any suitable programming language, which could easily be selected by one of ordinary skill in the art. The programming language chosen should be compatible with the computer hardware and operating system according to which the software application is executed. Examples of suitable programming languages include, but are not limited to, C, C++ and Java.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and other objects, aspects and advantages will be better understood from the following detailed description of a preferred embodiment of the invention with reference to the drawings, in which:

FIG. 1 is a block diagram illustrating content components of one embodiment of a movie in accordance with the teachings of the present invention;

FIG. 2 is a schematic illustration of a digital video item movie in accordance with the teachings of the present invention;

FIG. 3 is a schematic illustration of the parameters of two items from the movie in accordance with the teachings of the present invention;

FIG. 4 is a schematic representation of a template movie in accordance with the teachings of the present invention;

FIG. 5 is a schematic illustration of movie structure building blocks movie in accordance with the teachings of the present invention;

FIG. 6 is a flow diagram illustrating the steps in the creation of an edited video movie according to the teachings of the present invention;

FIG. 7 is a flow diagram showing the steps done by the video player during the editing of a video movie according to the teachings of the present invention;

FIG. 8 is a more detailed flow diagram elaborating the steps taken, and the resources used, in the creation of a video movie according to the teachings of the present invention; and

5 FIG. 9 is a schematic block diagram of an exemplary system according to the present invention for remote creation of video movies through a network.

#### DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

The present invention is a method for the automated creation of digital video movies, by 10 enabling automated search and retrieval of different source materials from databases, through the use of key-words, and by automatically adding previously selected style elements to them during the process of editing. This is done through the use of a software tool, called a template engine, according to which the movie elements are assembled. The template engine controls the operation 15 of the movie compiler program which performs the search, retrieval and editing operations of the video material. Changes in a template change the movie edited according to that template, so that new versions, adaptations and modifications are easy to make.

According to a preferred embodiment of the present invention, the use of templates for creating a video movie includes the definition of a template which is a structure for a particular type or genre of video, and optionally the definition of sets of editing elements and parameters of 20 video styles. The structure or genre of the video includes such categories as marketing videos, training videos and wedding videos, for example, which refer to the overall type of the video. Within each video structure, the video scripts and content typically follow similar structures and formulas.

On the other hand, the visual appearance of two video movies which have the same 25 structure may still optionally be quite different because of different styles of video editing. For example, different choices of the length of the clips, transitions, masks, effects and so forth may optionally cause two videos containing the same materials to appear to be completely different. In addition, the use of background audio data, or "sound track", which is also included within the editing process, also has a significant effect on the overall style or "look and feel" of the video 30 movie.

Preferably, the "look and feel" of a video can be changed by modifications to the template, such that a modification to the "look and feel" is propagated globally throughout the video without repeating the process of creating the video. Optionally, changing the "look and feel" of the video

includes, but is not limited to, altering one or more global editing parameters such as colors, pallets and fonts; editing video effects such as transitions; and changing the usage of one or more items from the media bank, such as background music for example.

5 A typical video movie is composed of one or of several parts, which will be termed here content components. Each content component includes one or several digital media items, which will be termed items. The items usually vary between the components of a video movie and between different video movies.

10 According to preferred embodiments of the present invention, the process of constructing and/or editing the video movie is either automated or alternatively is semi-automated. By "semi-automated", it is meant that the user is able to override at least one decision of the software tools according to the present invention. Therefore the present invention is optionally able to provide a sophisticated assistant for manual editing. This is achieved by the techniques which are described in greater detail below, with the addition of a proper user interface, which allows users to override automatic decisions of the software tools of the present invention.

15 The principles and operation of a system and a method according to the present invention may be better understood with reference to the drawings and the accompanying description, it being understood that these drawings are given for illustrative purposes only and are not meant to be limiting.

20 Referring now to the drawings, and by way of illustration only, Figure 1 is a schematic illustration of an exemplary video movie 202. Without intending to be limiting in any way, as an example video movie 202 includes a sequence of five content components, a first content component 210, a second content component 220, a third content component 230, a fourth content component 240 and a fifth content component 250. Each content component has a different function and therefore has a different style. As shown, video movie 202 is a sales promotion movie, so that in this example, first content component 210 is designated as the "opening" sequence, which begins video movie 202. Second content component 220 is designated as the "product introduction" sequence for introducing the product. Third content component 230 is designated as the "product configuration" sequence for describing the product, and fifth content component 250 is a "closing" sequence for completing video movie 202.

25 Each one of the content components is composed of different media items. The styles of these items are determined according to a template, as shown in Figure 4, which includes a supplied or a user defined video movie style. The media items of first content component 210 in this illustrative example are a company logo 212, a background 214, a title 216, a music sequence

218 and a sound effects sequence 219. Logo 212 is a bitmap, chosen from among several bitmaps located in a database. Background 214 is a graphical style item, chosen from among several backgrounds located in a database. Title 216 is a text item with a style, and is written in one of several of stylized alphabets located in a database. Background music item 218 and sound effects item 219 are chosen from among several possibilities stored in a database, according to the movie style.

In another illustrative example, fourth content component 240 includes another company logo item 242, also chosen from among several logos located in a database. Also included is a video clip item 244, which is a video clip illustrating the presented product and stored in a database. A background music item 246 is chosen from among several located in a database.

Items are stored in databases located in digital storage devices. These storage devices are often remote, requiring various communication links to retrieve the necessary items. Items of a similar nature are preferably grouped into one of several general groups, such as video clips, graphical items, sound tracks and other groups. All items belonging to a group have the same number and type of parameters, although the values of the parameters vary between items. Some of these values are unique to an item, and are used for the identification of that item and for the distinction between the different items in a group. For example, parameters found in many groups are keyword or keywords, which are also used to choose an item from among others in the database.

Figure 2 is a schematic representation of a media item 20. Media item 20 has at least one parameter, although in this example five such parameters are shown: a first parameter 21, a second parameter 22, a third parameter 23, a fourth parameter 24 and so on up to a parameter 28, as well as a digital content 29. Digital content 29 is the actual data connected to media item 20, including but not limited to, a graphic image, a sound bite, a video clip and text. The number of the parameters of an item and the nature or the type of the parameters of that item, such as two integers, a character array and the like depends on the group to which the item belongs and may vary between the groups. The parameters of an item are used for the identification, the retrieval and the handling of that item.

Figure 3 is a schematic representation, by way of illustration only, of the parameters and of the types of parameters for items of two exemplary groups: a long parameters list for a graphical item 32 and a short parameters list for a sound style item 34. In the illustrative example shown in Figure 3, the parameters of a graphical item include a name, which is a character string; keywords, which are stored in an array of character strings; a link to the file in which the data is stored, which

is a character string; the width, the height, the x-location and the y-location of the item in the frame, all of which are integers; the layer of the graphical item, which is a character string; the opacity of the graphical item, which is an integer; and the style of the graphical item and the alpha-channel, both of which are character strings. This type of exemplary parameter list is common to all of the 5 items in graphical items group.

As an example, the parameters of a sound style item could include the name, which is a character string; associated keywords for search and retrieval, which are an array of character strings; and the sound, which is a digital sound item, common to all items in that group.

Referring now to Figure 4, there is provided a movie template 40 for determining the style 10 of the video movie and the manner in which the components of the movie are assembled. Movie template 40 preferably features four blocks, and more preferably is implemented as a document written in the mark-up language XML.

As shown, a meta block 42 includes the definitions of global parameters. A style block 44 determines the movie style through the use of style parameters. Template 40 optionally refers to 15 items by their keywords. The style is chosen by the user from several categories, such as sales, training, sports, cartoon etc. The choice of style affects the way in which text, sound, sound effects and graphical items are processed and included in the completed movie. Each style preferably has predefined sets of associated parameters, such as editing parameters, which include but are not limited to fonts, colors and shapes; editing effects, which include but are not limited to, 20 transitions, masks, text manipulation, motion paths and so forth; and media elements, which include but are not limited to, background music, images, sound effects and short animations.

Although a video movie is generated according to a particular style, optionally and preferably template 40 can include one or more definitions which override the selected style.

A layout block 46 defines regions and layering. Preferably, at least one layout parameter is 25 specific for a particular video style.

A body block 48 defines the synchronization and positioning of media elements along the time axis, while maintaining the integrity of the layout definitions for these elements. A media element parameter can be specific to a style while maintaining the integrity of the style and layout definitions. Optionally, at least one media element is obtained from a central database (see for 30 example Figure 9 below) and at least one media element is provided by the user.

The structure of the body of template 40, as defined in body block 48, needs to maintain rigidity in order to support the narrative structure according which template 40 was designed. However, the body needs to be sufficiently flexible in order to meet the needs of different users

with different materials. Thus, more preferably, body block 48 contains a rigid structure of flexible template units, or scenes in the video movie.

Each template unit is composed of a sequence of media elements, or even other template units. These elements may optionally have an enforced order within the sequence. A unit may be 5 considered mathematically as a regular expression, in which the atomic elements are audio (A), video (V), text (T), image (I) and animation (VA). Each atom may optionally be followed by a bound on the number of appearances of the atom in the sequence.

For example, a unit which is called "opening scene" could be defined according to one of the following definitions: a single text clip (unit = T); a combination of one video clip with one 10 overlaid text line (unit = VT); or a video clip with a sequence of one or more overlaid text lines (unit = VT{1}).

Referring now to Figure 5, there are provided two illustrations of video movie content components, or building blocks: a content component 52 which is composed of items for determining a title sequence; and a content component 54, composed of items for determining a 15 news article. The compositions of both components are determined by the user during the preparation of the template of that movie. For example, content component 52 features a title which is a bitmap with a color, style and font. Parameters are also set to determine the motion of the title, if any. By contrast, content component 54 features a plurality of video clips for the news article, including a sound track and optionally including text, graphics and/or animation.

Figure 6 shows a block diagram illustrating the method by which the digital video movie is 20 created. A list of content components 62 is determined by the user, and forms a part of a movie structure model 64 in a template 70. A movie style description, containing at least one style 67 as shown, is introduced to a part 68 of template 70. The parameters included in template 70 are provided to a movie compiler 72 that, through the use of the parameters included in template 70, 25 searches, selects and retrieves the required items from a database 74. The retrieved items are processed by movie compiler 72 and a finished video movie 76 is generated.

As many changes in the finished video movie require only small modifications to the template, these changes are easy to make. Also, as many of the database items are used by several 30 video movies, and as in most cases only the movie templates need to be stored, there is substantial saving in video storage space compared to the storage requirements of conventionally created video movies.

Figure 7 illustrates a way in which the selected video items are processed by the movie compiler according to the contents of template 70. A sound style item 82 is processed with a sound

item 84 to form a sound file 86. In a similar fashion, a text style item 92 is processed with a text item 94 to form text file 96. Similarly, a graphical style item 92 is processed with a graphical item 94 to form a graphical file 96. Video style items, text items, sound items and graphical items are all examples of "accessory items". Files 86, 96 and 106 are processed with a video file 112, to create 5 a finished video movie 114.

Referring now to the method by which the video movies are created, the user first creates a template by manually or automatically manipulating elements of the structure of the movie. Next, the user lists all of the keywords and parameters of the source items which are to be used in the movie, such as video clips, logos, sound and text. The movie compiler retrieves these items and 10 compiles these items according to the associated movie style. The movie style affects the way in which the logos, the sound items, the graphical style items and the text are added to the video clips, and adds effects determined by the style. For example, the text size, its font and its location on the frame are determined by the style. The style also affects the way in which transitions between parts of the movie takes place. All of this is done by the movie compiler, using the user-prepared 15 template.

Figure 8 is a more detailed description of the process by which the video movie is created. As shown in box 120, the process is started by choosing or creating a template, as shown in box 122. The template includes the key-words of the source items to be included in the movie, and in the desired sequence. The source items are selected from a source library storage device, as shown 20 in box 124. These items are divided into several groups, such as audio, video, bitmap, text, and are also categorized, or divided into several source categories according to their function, such as introduction, explanation, overview and others.

As shown in box 126, a Movie compiler program accepts the template and retrieves the requested source items from the storage device. The retrieved source items are grouped in a 25 logical area, as shown in box 128. The Movie compiler then searches a library of media items according to the style listed in the template, as shown in box 136. A representative list of style categories includes, but is not restricted to, categories such as Corporate, Cartoon, Sports, Nature, and sub-categories such as specific Sports: basketball, swimming, etc., listed in box 134.

The Movie compiler then retrieves items such as video, music, sound effects, animation, 30 background and borders according to keywords, as shown in box 130. The Movie compiler then groups these items in a logical area. If necessary, optionally and preferably three-dimensional (3-D) graphics are rendered, as shown in box 132. The Movie compiler renders the transitions between the shots, according to the style, as shown in box 138. Then the sound track is created by

laying in the desired order the narration, the music and sound effects, as shown in box 140. The movie is then finally output to a streaming server, as shown in box 142.

Preferably, there is also provided the option of manually editing the visual layout of the content components by the provision of a graphical editing environment, permitting the manual manipulation of items on a screen.

According to preferred embodiments of the present invention, as described with regard to Figure 9, a remote application system 300 enables the user to create a video movie from a template through a Web browser-based user interface 302. Web browser-based interface 302 is connected to a central movie creation unit 304 through a network, which could be the Internet 306 as shown.

For this preferred embodiment, the user is able to create the video movie at the remote central movie creation unit 304 and then to download the data file or files containing the movie. Therefore, preferably the data formats of these files are portable over networks such as Internet 306. Examples of suitable data formats include, but are not limited to, streamable data formats such as RealMedia™, ASF (Advanced Streaming Format; Microsoft Corp, USA), streamable QuickTime™ and Flash™; and XML-based data formats such as SMIL (Synchronized Multimedia Integration Language; extension of XML) , RealText™ and RealPix™.

Central movie creation unit 304 preferably includes a template engine 308 for performing the data processing related to template creation, and for managing associated service modules such as a video processing module 310 and an audio processing module 312 as shown. Template engine 308 is optionally implemented as a software module which is operated by a central server computer, for example, although other implementations are also possible as previously described.

Template engine 308 preferably manages processes such as the creation of a new movie through a structured user-friendly process; generating a preview format video; and creating a movie for playback. In terms of creation management, template engine 308 manages the process of making the movie, which requires dynamic generation of a user interface (UI) for inserting and/or updating the parameters of the media elements which are currently be manipulated for the movie, and then storing this input. In addition, template engine 308 preferably dynamically generates a UI for navigating in a “wizard” software process, which is an example of the previously mentioned structured user-friendly process.

With regard to generating the preview format video, template engine 308 preferably generates media files “on the fly”, in real time as the video movie is created. These media files optionally include, but are not limited to, video, audio, image and animation files. More preferably, the latest version of each media file is stored for those files which require significant

computational resources to create, such as raw graphical processing for GIF (Graphics Interchange Format) files, RM (Real Media file format by RealNetworks Ltd.) files, and audio files.

Alternatively, files which require fewer computational resources to create, such as XML based media files such as RealPix™ and RealText™, or vector-based media files such as Flash™, can 5 optionally be created entirely “on the fly” and not stored.

Once the media files have been created, template engine 308 generates a video file for playing the movie and synchronizing the component media files. The video file is created according to the template. More preferably, there are two such files which have two different purposes. In order to allow the user to preview the video as it is being created, template engine 308 10 preferably generates SMIL files. The preview displays the entire movie, including portions which have not yet been specified by the user. Most preferably, non-specified elements are shown as an abstract title or representation. The second type of file is a playback video file, which is the file for the final video movie, preferably containing all of the media files and elements of the video in a single file.

According to a preferred embodiment of the present invention, the template is parsed by a parser module 314, which examines the basic structure of the template and executes the data contained therein to form the video movie. Parser module 314 also preferably examines the template for inner integrity, for example in order to detect contradictions within the template definitions. One example of such a contradiction is a reference by a media element to a non-defined style or layout element. In addition, parser module 314 preferably examines the integrity 20 of the template with regard to the system.

The specific elements of the template which are integrated by template engine 308 preferably include layout elements, effect elements, media elements, and compound elements, as previously described. Preferred examples of each of these elements are described in greater detail 25 below with regard to a particular illustrative implementation of the present invention with SMIL files.

Layout elements include region and root-layout elements, for describing the rendering surface size and appearance, and the position, size and scaling of absolutely positioned media elements, such as video, image, text, hyper-links and flash data, which are played within such a 30 rendering surface. Preferably, the rendering surface is a RealPlayer™ GUI (graphical user interface; RealNetworks Ltd., USA).

The region element is a placeholder for media object elements. The region element controls the position, size and scaling of the media object elements which is be shown in that

region. Within the region, attributes and members are preferably defined. Attributes include such characteristics as the color of the background, if any; and rules for specifying how a visual media object is to be fitted within the region if the boundaries of the object are larger than the boundary of region.

5 For example, the invocation of one rule could optionally cause the height and width of the visual media object to be scaled independently so that the visual content just touches the edges of the region.

Alternatively, if one dimension of the visual object is smaller than the corresponding dimension of the region, any remaining visual space in the region is optionally filled with 10 background color or patterns. For the opposite situation, the visual object is optionally rendered starting from a predefined point, and any excess visual image of the object is cropped to fit within the region. Other rules may specify different mechanisms for cropping or scaling the visual media object in order to fit within the region.

The members of the region include the style specific values for the positioning and size 15 attributes of the region.

The root-layout element preferably determines the value of the layout properties of the root element, which in turn determines the size of the viewport, such as the GUI provided by the RealPlayer™. The root-layout element can have various attributes, which are defined according to the definitions for the region.

Effect elements include transitions and masks. The special effects elements describe the 20 operation which should be applied to one media element, such as mask, fade-in from color, zoom-in and so forth, or the operation which should be applied to a plurality of media elements, such as transitions between elements for example. These elements are defined according to the start and end times (duration) within the video movie, as well as according to the media elements to which 25 the effect is to be applied.

Media elements have been previously described, and include, but are not limited to, video data, audio data, image data, text data, hyper-links and vector animation. The hyper-link 30 optionally represents an event, such as opening and displaying a Web page in the context of the movie for example. An example of vector animation is the Flash™ technology of Macromedia Ltd.

The media elements are defined according to a plurality of attributes, such as the region for containing the element, and either the duration of the element (for static media elements) or the start and end times (for dynamic media elements). In addition, the media element may optionally disappear or simply freeze within the frame after being played. Other optional attributes include a

source URL, for the location of the media element and/or the data for generating the element; a string title for identifying the element; and a MIME type of the media element.

Compound elements are sets of elements which create a tree structure for generically describing the synchronization of the media elements along the time axis. Examples of different types of compound elements include, but are not limited to, a sequence element, which is a list of media objects for being played one after the other; a parallel element, which is a list of media objects for being played in parallel; an OpenSequence element, which is an initially empty list that has a list of media elements that can be added one after the other to eventually form a sequence in the length of N elements; and a chapter element, which is a type of sequence needed for the template engine for generating the navigation options.

Preferably, all of the necessary information for template engine 308 and parser module 314 is stored in a database 316.

While the invention has been described with respect to a limited number of embodiments, it will be appreciated that many variations, modifications and other applications of the invention may be made.

**WHAT IS CLAIMED IS:**

1. A method for the creation of a video movie from a plurality of video items, each of the plurality of video items having at least one video parameter, the steps of the method being performed by a data processor, the method comprising the steps of:

- (a) choosing a template, said template including an identifier for retrieving at least one video item, said at least one video item forming a basis for at least a part of the video movie and said template;
- (b) choosing a style parameter for determining a style of said at least a part of the video movie;
- (c) choosing at least one accessory item selected from the group consisting of a video style item, a text item, a sound item and a graphical item according to said style parameter; and
- (d) assembling said at least one video item and said at least one accessory item to produce said at least a part of the video movie according to said template and according to said style parameter.

2. The method according to claim 1, wherein said identifier of said template identifies the at least one video item according to the parameter of the at least one video item..

3. The method according to claim 1, wherein said style parameter determines a style for said at least a part of the video movie.

4. The method according to claim 3, wherein the step of assembling said at least one video item and said at least one accessory item further comprises the step of:

- (i) editing at least one of said at least one accessory item and said at least one video item according to said style of said style parameter.

5. The method according to claim 4, wherein the step of editing at least one of said at least one accessory item and said at least one video item further comprises the step of determining a characteristic of said at least one accessory item selected from the group consisting of a horizontal position, a vertical position, a size, a color and a layer according to said style parameter.

6. The method according to claim 5, wherein the video movie is divided into a plurality of portions and said style parameter determines said style for only one of the plurality of portions according to said template.

7. The method according to claim 6, wherein said plurality of video items and said at least one accessory item are stored in a database, such that said plurality of video items and said at least one accessory item are retrieved from said database according to a keyword.

8. The method according to claim 1, further comprising the steps of:
  - (d) editing a template structure of said template, said template structure defining a video structure of said at least a part of the video movie; and
  - (e) retrieving the at least one video item according to said video structure.

9. The method according to claim 8, wherein the step of retrieving the at least one video item is performed substantially automatically, such that said at least a part of the video movie is created substantially automatically.

10. The method according to claim 1, further comprising the step of:
  - (d) manually editing a visual layout of said at least a part of the video movie.

11. The method according to claim 10, wherein the step of manually editing said visual layout further comprises the steps of:

- (i) displaying said at least one video item and said at least one accessory item; and
- (ii) manually manipulating said at least one video item and said at least one accessory item.

12. The method of claim 1, wherein said template is composed of a meta block for containing definitions of global parameters, a style block for defining at least one template style; a layout block for determining at least one region for containing said at least one video item; and a body block for defining synchronization and positioning of said at least one video item.

13. The method of claim 1, wherein steps (b)-(d) are performed automatically according to said template of step (a).

14. A method for the automatic creation of a video movie from a plurality of video items, each of the plurality of video items having at least one video parameter, the steps of the method being performed by a data processor, the method comprising the steps of:

- (a) creating a template structure of a template, said template structure defining a video structure of at least a part of the video movie, said template including an identifier for retrieving at least one video item, said at least one video item forming a basis for at least a part of the video movie and said template;
- (b) retrieving the at least one video item according to said video structure;
- (c) choosing a style parameter for determining a style of said at least a part of the video movie;
- (d) choosing at least one accessory item selected from the group consisting of a video style item, a text item, a sound item and a graphical item according to said style parameter; and
- (e) assembling said at least one video item and said at least one accessory item to produce said at least a part of the video movie according to said template and according to said style parameter.

15. The method of claim 14, wherein said template structure is composed of a meta block for containing definitions of global parameters, a style block for defining at least one template style; a layout block for determining at least one region for containing said at least one video item; and a body block for defining synchronization and positioning of said at least one video item.

16. A system for creating a movie according to a template by a user, the system comprising:

- (a) a user interface for operation by the user to create the template;
- (b) a template engine for reading the template and for creating the movie according to the template; and
- (c) a network for connecting said user interface to said template engine.

17. The system of claim 16, wherein said user interface is a Web browser, and said network is the Internet.

18. The system of claim 17, further comprising:
  - (d) a parsing module for parsing the template for errors before the template is read by said template engine.

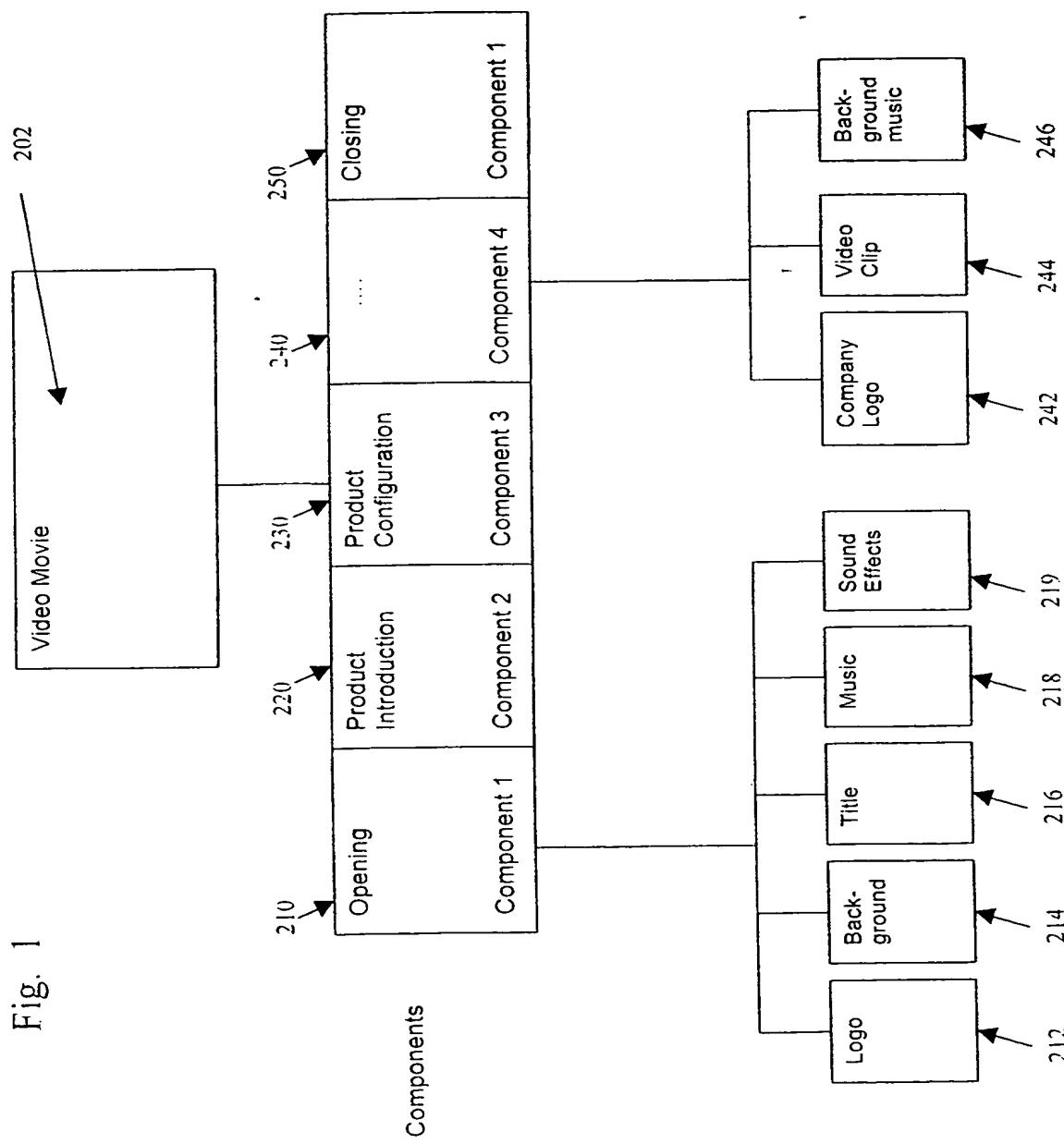


Fig. 2 Digital Video Item

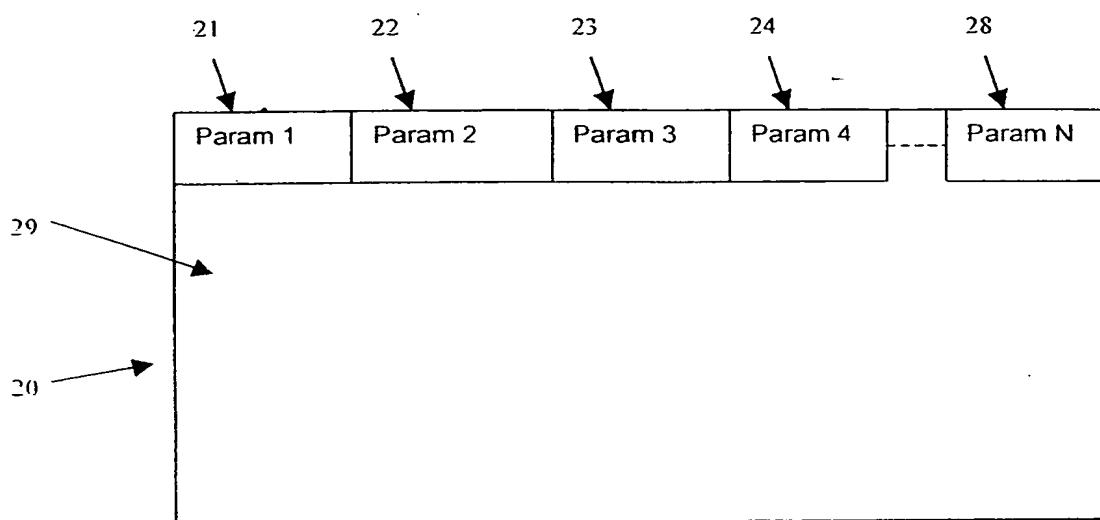


Fig. 3 Typical Digital Video Parameter Lists

Graphical Item	
Parameter Name	Type
Name	String
Keywords	String Array
Link to file	String
Width	Integer
Height	Integer
Opacity	Integer
Layer	String
X Location	Integer
Y Location	Integer
Style	String
Alpha Channel	String

32

Sound Style Item	
Parameter Name	Type
Name	String
Keywords	String Array
Sound	Sound Item

34

Figure 4

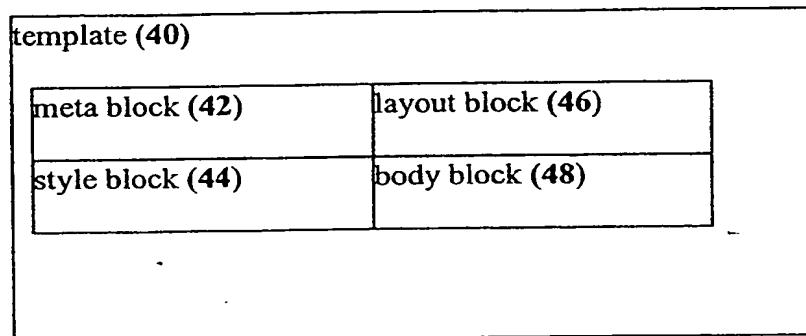


Fig 5 Movie Structure Building Blocks

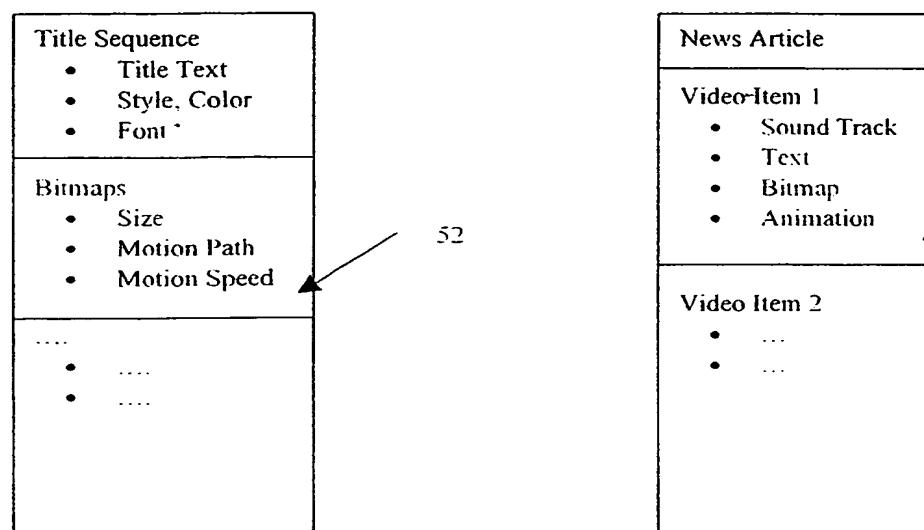


Fig. 6 Movie Creation Flow Diagram

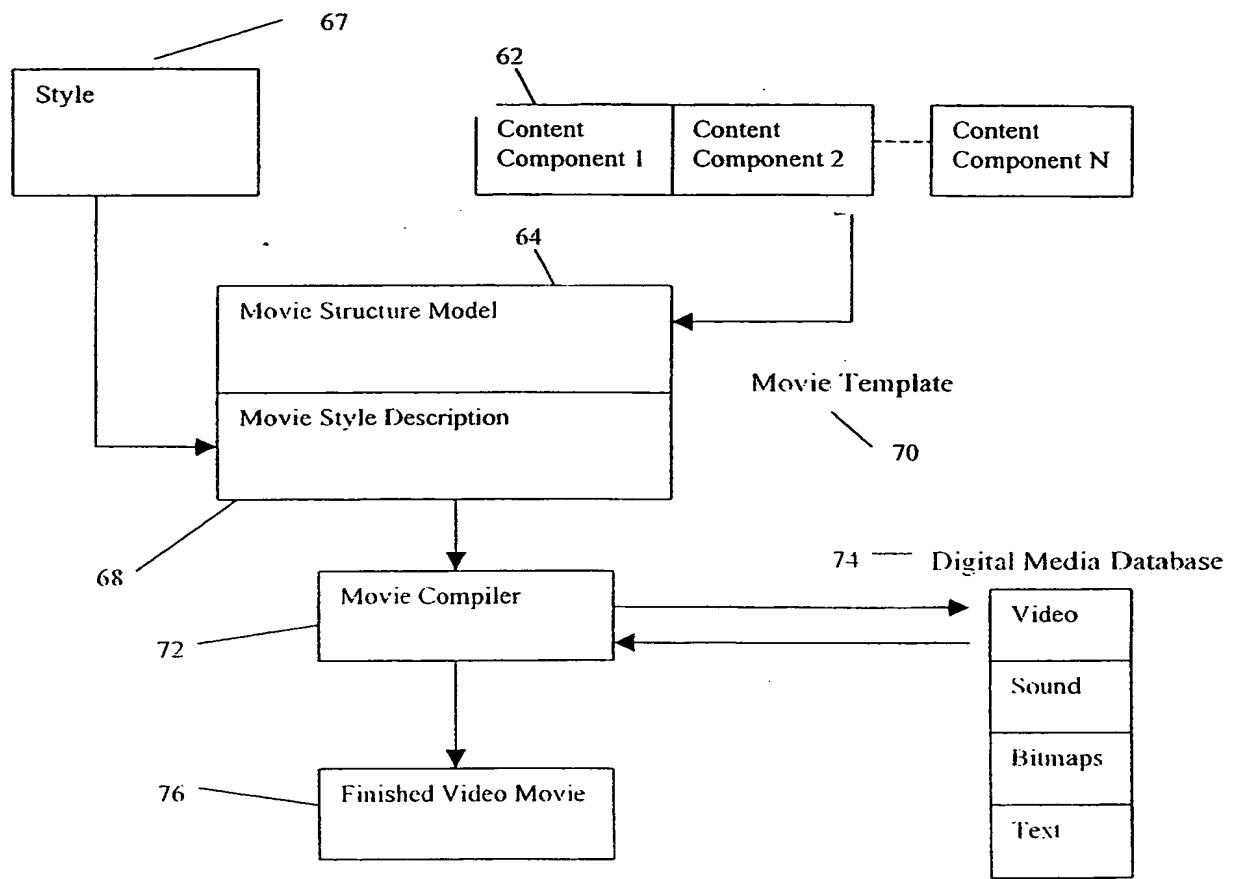


Fig 7 The Processing of Video Items

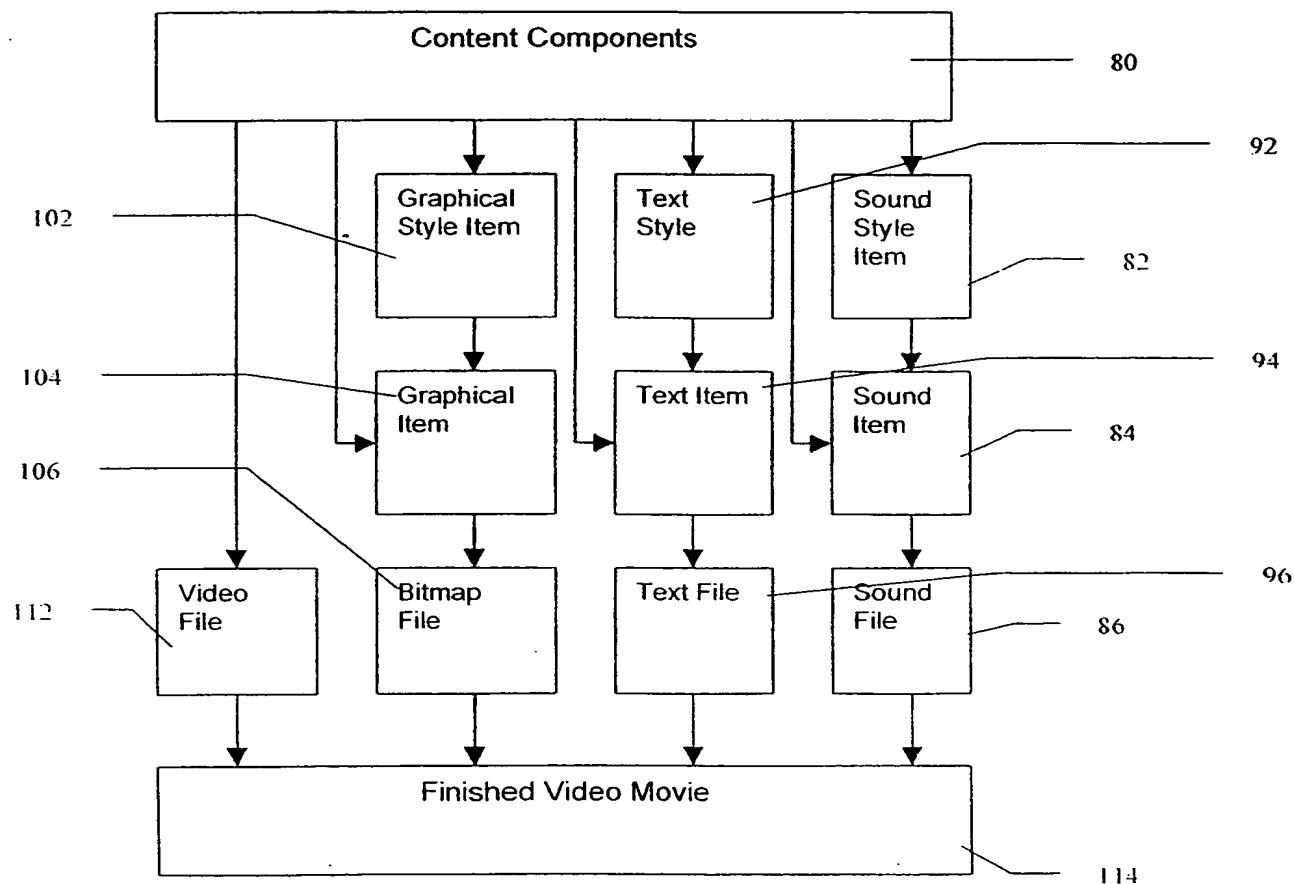
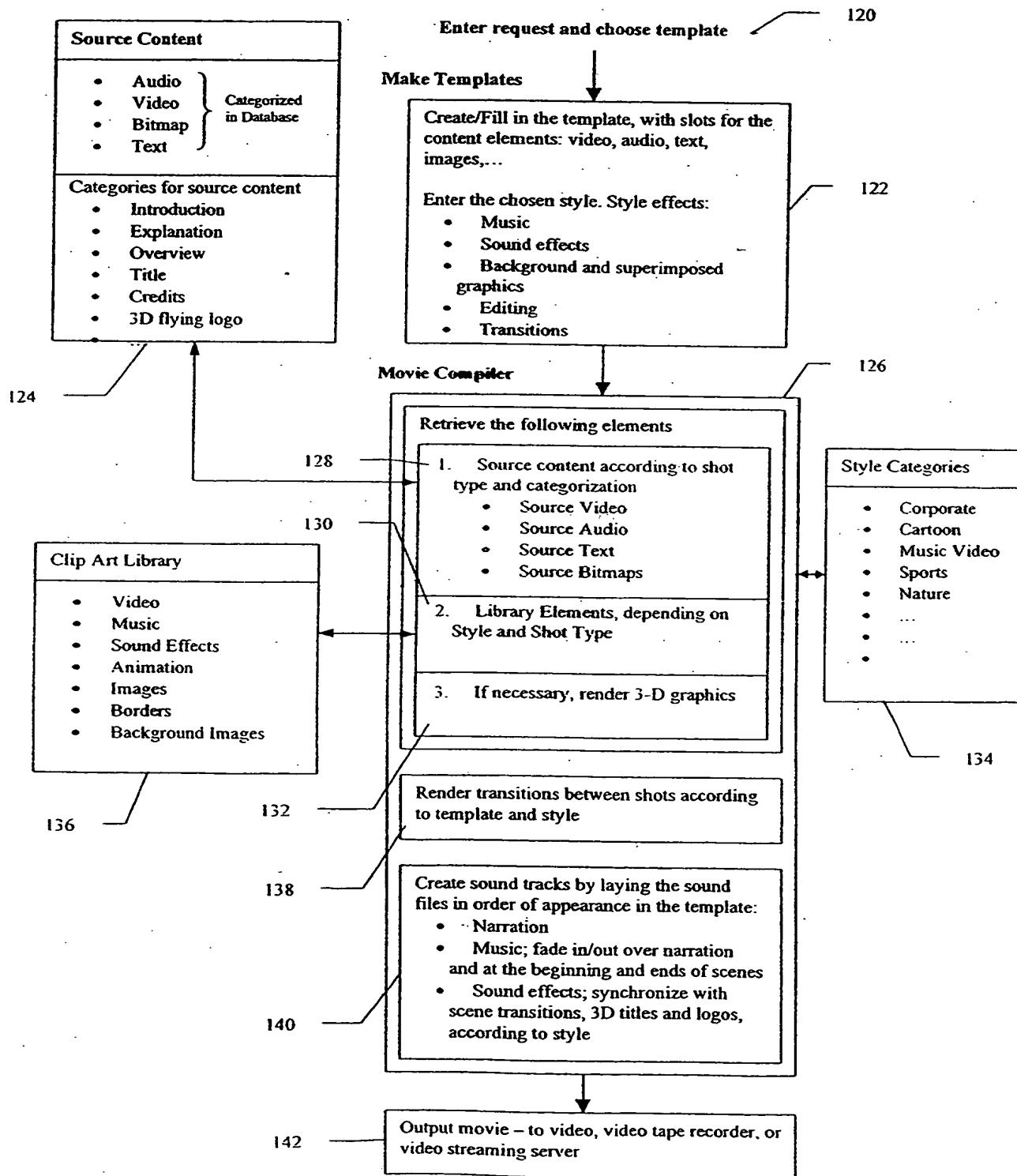
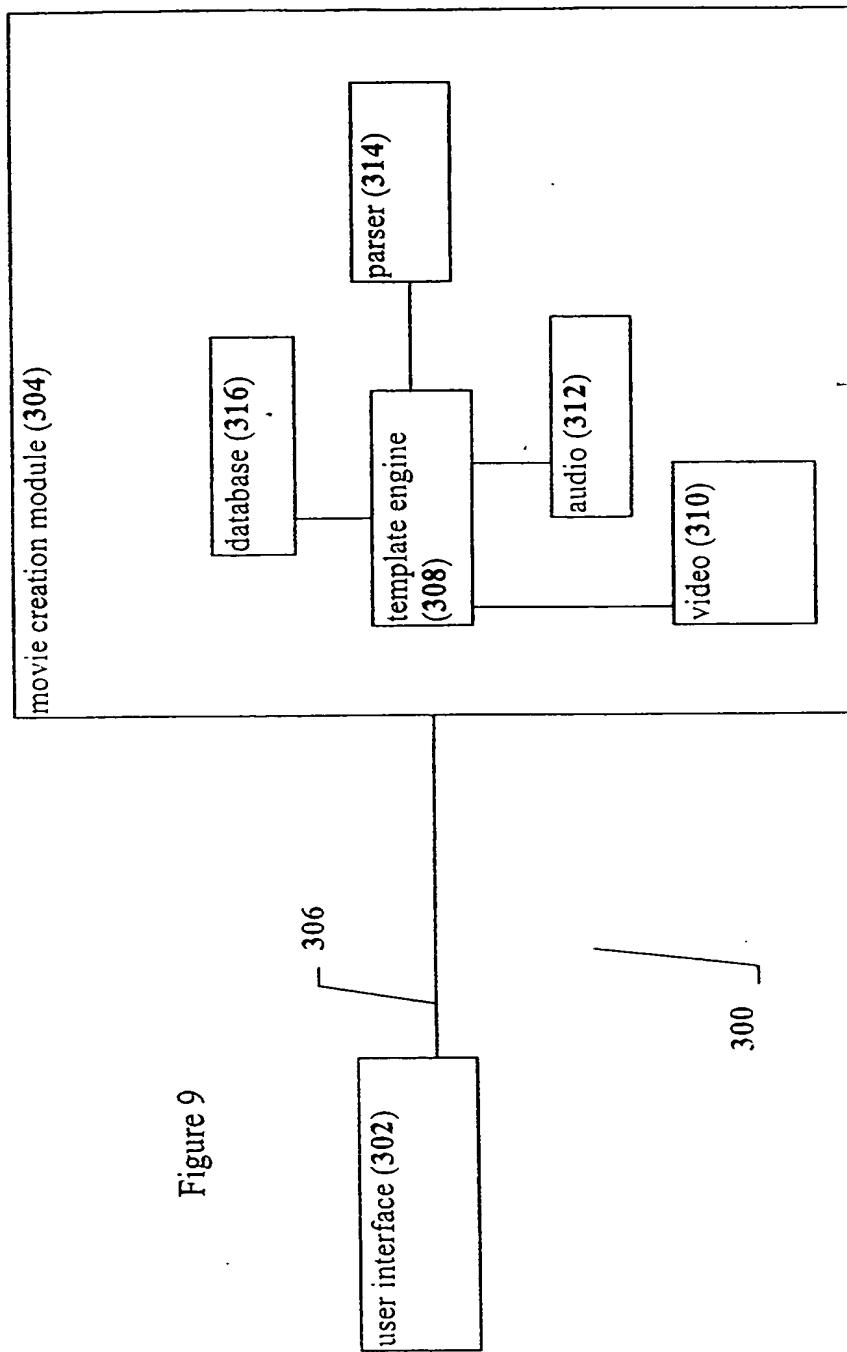


Fig 8. Movie Creation Steps and Resources







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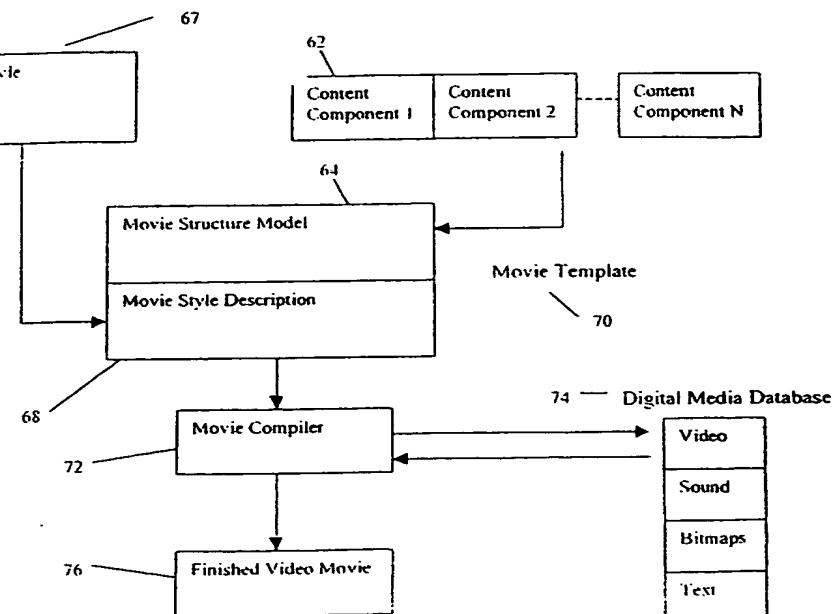
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

**(54) Title: CREATING AND EDITING DIGITAL VIDEO MOVIES**

**(57) Abstract**

A software-based method that enables the automated creation, modification, and editing of digital video movies (76) from digital data items searched in, and retrieved from, digital media databases (74). This is done through the use of software tools, specific to each video movie, which are called templates (70). A template (70) includes user-selected parameters which are part of the digital video items that are to form the movie (76), or that effect these items. Some of these parameters are used by a software program for the search and the retrieval of the those digital video items, while other parameters are used by that software program for the adaptation of the selected items during editing, leading to flexibility and adaptability in the creation of the video movies (76).

## Movie Creation Flow Diagram



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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US99/31023

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : G06F 3/00, 15/16; H04H 1/00; H04N 7/14  
 US CL : 345/328; 348/7, 12, 722; 455/5.1; 709/217

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 345/326, 327, 328; 348/6, 7, 12, 722; 455/3.1, 4.1, 4.2, 5.1, 6.3; 709/217, 218, 219

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,675,752 A (SCOTT et al) 07 October 1997, see whole document.	1-18
Y	US 5,537,528 A (TAKAHASHI et al) 16 July 1996, see whole document.	1-18
Y	US 5,713,021 A (KONDO et al) 27 January 1998, see whole document.	1-18

Further documents are listed in the continuation of Box C.

See patent family annex.

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